

CLAIMS

What is claimed is:

KK
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1. A culturally modified lactic acid bacterial cell that has, relative to the cell from which it is derived, an increased content of a porphyrin compound.

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2. A cell according to claim 1 that contains at least 0.1 ppm on a dry matter basis of a porphyrin compound.

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3. A cell according to claim 1 that contains a detectable amount of a cytochrome.

4. A cell according to claim 3 that contains at least 0.1 ppm on a dry matter basis of a cytochrome.

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5. A cell according to claim 4 that contains at least 0.1 ppm on a dry matter basis of cytochrome *d*

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6. A cell according to claim 1 which is of a bacterial species selected from the group consisting of *Lactococcus* spp., *Lactobacillus* spp., *Leuconostoc* spp., *Pediococcus* spp., *Streptococcus* spp., *Propionibacterium* spp., *Bifidobacterium* spp. and *Oenococcus* spp.

7. A cell according to claim 6 where the bacterial species is of *Lactococcus lactis*, including *Lactococcus lactis* strain CHCC373 deposited under the accession number DSM12015.

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8. A cell according to claim 1 which, when it in the form of a cell suspension is inoculated in a concentration of 10^7 cells/ml into low pasteurised skimmed milk having 8 ppm of dissolved oxygen and leaving the milk to stand for about two hours at a temperature of about 30°C consumes at least 25% of the oxygen.

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9. A cell according to claim 8 where the cell consumes at least 50% of the dissolved oxygen.

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10. A cell according to claim 1, which, relative to the cell from which it is derived, has a decreased NOX activity and/or a decreased LDH activity.

Sub B

11. A cell according to claim 10 that has a NOX activity which is decreased by at least 10%.

5 12. A cell according to claim 10 that has a LDH activity which is decreased by at least 10%.

Sub A2

13. A starter culture composition comprising the culturally modified lactic acid bacterial cell of any of claims 1-12.

10 14. A composition according to claim 13 where the composition is in the form of a frozen, liquid or freeze-dried composition.

15 15. A composition according to claim 13 containing an amount of viable culturally modified lactic acid bacterial cells which is in the range of 10^4 to 10^{12} CFU per g.

16. A composition according to claim 13 that comprises cells of two or more different lactic acid bacterial strains.

20 17. A composition according to claim 13 which further comprises at least one component enhancing the viability of the bacterial cell during storage, including a bacterial nutrient and/or a cryoprotectant.

Sub A3

25 18. A method of reducing the oxygen content in a food or feed product or in a food or feed product starting material comprising adding to the product or to the starting material an effective amount of the culturally modified lactic acid bacterial cells according to any of claims 1-12 or the starter culture composition according to any of claims 13-17.

30 19. A method according to claim 18 wherein the amount of modified cell is in the range of 10^4 to 10^{12} CFU per g.

20. A method according to claim 18 wherein the starting material for the food product is selected from the group consisting of milk, a vegetable material, a meat product, a fruit juice, a must, a wine, a dough and a batter.

Sub A4

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21. A method of improving the shelf life and/or the quality of an edible product comprising adding to the product an effective amount of the culturally modified lactic acid bacterial cells according to any of claims 1-12 or the starter culture composition according to any of claims 13-17.

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Sub A5

22. A method of preparing a fermented food or feed product, comprising adding an effective amount of the culturally modified lactic acid bacterial cell according to any of claims 1-12 or the composition of any of claims 13-17 to a food or feed product starting material, wherein the cell or the composition is capable of fermenting said starting material to obtain the fermented food or feed.

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23. A method according to claim 22 wherein the starting material for the food product is selected from the group consisting of milk, a vegetable material, a meat product, a fruit juice, a must, a wine, a dough and a batter.

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24. A method according to claim 23 wherein the resulting fermented food product is a dairy product including a product selected from the group consisting of cheese and buttermilk.

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Sub A5 1
25. Use of the lactic acid bacterial cell of any of claims 1-12 or the composition of any of claims 13-17 for the production of a metabolite produced by the cell or the composition or by a non-modified cell co-cultivated therewith.

26. Use according to claim 25 where the metabolite is selected from the group consisting of lactic acid, acetaldehyde, α -acetolactate, acetoin, acetate, ethanol, diacetyl and 2,3-butylene glycol.

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Sub A6
27. Use of the lactic acid bacterial cell of any of claims 1-12 or the composition of any of claims 13-17 for the production of a bacteriocin.

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28. Use according to claim 27 where the bacteriocin is selected from the group consisting of nisin, reuterin and pediocin.

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